

New CMS trigger strategies for the Run 3 of the LHC

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The Compact Muon Solenoid (CMS) experiment at the Large Hadron Collider (LHC) features a sophisticated two-level triggering system composed of the Level 1 (L1), instrumented by custom-design hardware boards, and the High-Level Trigger (HLT), a software based trigger. The CMS L1 Trigger relies on separate calorimeter and muon trigger systems that provide jet, e/γ , τ , and muon candidates along with energy sums to the Global Trigger, where the final selection is made. The L1 trigger hardware was upgraded to handle proton-proton collisions at a center-of-mass energy of 13 TeV with a peak instantaneous luminosity of $2.2 \cdot 10^{34} \text{ cm}^{-2} \text{ s}^{-1}$, more than double the design. For the Run 3 of the LHC, an optimized and expanded Level-1 and HLT trigger physics menu has been developed to meet the requirements of the ambitious CMS physics program. A wide range of measurements and searches will profit from the new features and strategies implemented in the trigger system.

Alternate track

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